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Mobile Learning in Higher Education in the Asia-Pacific Region

Harnessing Trends and Challenging Orthodoxies

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RESEARCH ASSOCIATION

Springer

EDUCATION IN THE ASIA-PACIFIC REGION: ISSUES, CONCERNS AND PROSPECTS

Volume 40

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Chapter 9
The State of Practice of Mobile Learning in Universitas Terbuka Indonesia

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Abstract As a distance learning university, Universitas Terbuka (UT) uses mobile technology as an integral part of its online learning system. In addition to its mobile interface website, online tutorials are also made accessible through mobile as well as handheld devices. In other words, UT students can literally study through their mobile devices from the very first activity of registering for courses, paying the tuition fee, obtaining digital learning materials, accessing the digital library, reading online journals, as well as participating in online tutorials. With the continuous development of increasingly sophisticated smartphone technologies, it is important for UT to continuously improve its online learning system. The development of UT's mobile learning, which was started in 2013, has gone through several phases. The first phase was the preparation of infrastructure, which includes the development of applications and frameworks. The second phase was the content development, which was done by the faculty using various media including text, audio, video, multimedia, and the utilisation of open education resources (OER). The last and third phase was the program delivery, which involves tutors, technical/IT assistants, and other support systems to allow students with seamless access to mobile learning using various mobile devices. This seems to be effective as shown by the data that demonstrates UT mobile learning is being accessed by students using different mobile devices with various operating systems. This chapter will give a glance on the state of practice of mobile learning in Indonesia as well as elaborate on the process and practice of mobile learning at Universitas Terbuka (The Indonesia Open University) as a dedicated distance learning university.

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9.1 Background

The presence of mobile technology has opened up opportunities for every individual to communicate more quickly and obtain information more easily. It has been claimed that the capabilities of mobile technology in providing convenience, flexibility, engagement, and interactivity have made mobile learning more attractive to students (Chen and Denoyelles 2013). Furthermore, mobile technology has given birth to the creation of various mobile devices ranging from simple mobile phones to sophisticated smartphones with many features and affordances. Research by eMarketer (2013) shows that mobile phone users (all types) in Asia-Pacific in 2013 reached 2.43 billion or about 56.3% of total mobile phone users in the world. It is estimated that in 2017, mobile phone users in Asia-Pacific will reach 3 billion out of the total 5.10 billion of the world's users. This data shows the rapid advance of mobile equipment in the Asia-Pacific Region, as predicted by Baggaley (2007) that Asia would lead the world in the use of mobile learning.

Many studies related to the rapid growth of Information and Communication Technology (ICT) in education through mobile devices have been conducted. Data show that the popularity of mobile technologies among university students has been increasing significantly (Chen and Denoyelles 2013; Chen et al. 2015; McGraw Hill 2014). A study by Traxler and Wishart (2011) shows that mobile learning in the UK has been used both at higher education and secondary schools settings, especially to personalise and contextualise the learning environments and to enrich field trip activities. This study specifically reported that the function of texting (Short Messaging Service or SMS) has been viewed as 'an innovative pedagogic format uniquely suited to the technology' (Traxler and Wishart 2011, p. 11).

Another study conducted by McGraw-Hill Education (2014) revealed that while many students still prefer laptops as the first choice for studying, the demand for portable e-books and mobile learning tools is increasing at a significant rate. The McGraw-Hill Education study also found that 86% of surveyed students think that technology helps them perform their academic tasks more effectively and efficiently, and more than 60% of them now use their mobile phones to study (McGraw-Hill Education 2014). Similarly, based on a multi-year study, Chen et al. (2015) found that ownership of mobile devices among students of the University of Central Florida was very high. Their study found that although students and instructors still need some technical, logistical, and pedagogical support for optimising the potentials of mobile learning, 73% out of 1,181 surveyed students were reported as using smartphones, which is higher than those who used tablets (45%) and e-book readers (17%). According to the students, they use the smartphones mostly for looking up lecture topics during face-to-face class time and for accessing course textbooks both during and outside of class. Based on their experience, students felt that using mobile devices:

1. Makes it easier to access coursework (72%)
2. Increases communication with their classmates (65%)
3. Increases communication with instructors (60%)

Table 9.1 The use of mobile devices in Asian countries

	Project name	Country	Educational purpose	Technology used
1.	Viability of SMS Technologies for Non-formal Distance Education	Philippines	English language and math training	SMS
2.	Viability of SMS Technologies for Non-formal Distance Education	Mongolia	English language, emergency care, and endocrinology training	SMS
3.	Mobile Telephone Technology as a Distance Learning Tool	Bangladesh	Distance education course via national television	SMS
4.	An Experiment in the Use of Mobile Phones for Testing at King Mongkut's Institute of Technology	Thailand	Test taking	SMS
5.	Improving Literacy in Rural India: Cell phones games in an After School Program	India	English language training	Cell phone games
6.	Learning Communities enabled by Mobile Technology: A Case Study of School-Based, In-service Secondary Teacher Training	Bangladesh	Secondary teacher training	SMS, MMS, teleconferencing

Source: Valk et al. (2010)

4. Increases their knowledge in their field of study (48%)
5. Improves the quality of their work (43%)
6. Increases their motivation to complete coursework (42%).

The findings show that using mobile devices in learning was perceived to give students advantages and flexibility in accessing coursework and in communicating with both their classmates and instructors. It is perhaps for the same reasons that the use of mobile devices for learning in many Asian countries is also increasing significantly. Table 9.1 depicts the use of mobile phones to improve educational outcomes in the Philippines, Mongolia, Thailand, India, and Bangladesh as reported by a research conducted by Valk et al. (2010).

The findings show that mobiles can significantly reduce barriers to education while attaining educational outcomes comparable to those of traditional educational methods. This result was specifically shown by the Philippines, Bangladesh SMS, and Thailand projects. However, there remain substantial issues regarding future phone interventions to be considered in order to improve access to education. Valk et al. (2010, p. 134) explain that specifically in Thailand, 'technological issues such as screen size can remain a barrier to effective mLearning'. Moreover, some technical difficulties were experienced in the Philippines and Mongolia projects emphasising that 'the quality of the software and hardware is instrumental to the success of mLearning modalities' (Valk et al. 2010, p. 134). Another focus of the projects was how to use mobile learning to promote new learning. The feedback of

Table 9.2 Gross enrolment rates in tertiary education in Asia

Country	% of school-age population (within 5 years of secondary school age) enrolled in tertiary education in 2008
The Republic of Korea	98.1
New Zealand	78.5
Australia	77.0
Japan	58.0
Macao, China	56.5
Hong Kong, China	55.6
Mongolia	49.8
Thailand	44.7
Malaysia	36.5
Iran (The Islamic Republic of Iran)	36.1
Philippines	28.7
China	22.7
Indonesia	21.3
Brunei Darussalam	16.0
Lao People's Democratic Republic	13.4
Cambodia	7.0
Bhutan	6.6
Pakistan	5.2

Source: So (2012)

the participants shows that 'mLearning enables learner-centred education, particularly in comparison to traditional distance education models' (p. 135) in which mobile learning provides interaction. However, only the Bangladesh teacher training project reporting on the state of mobile infrastructure directly affects the success of mobile learning interventions.

Another project was conducted in some Asian countries by the United Nations Educational, Scientific, and Culture Organization (So 2012) in 2012 focusing on illustrative initiatives and policy implications of mobile learning in Asia. This project seemed to be the embryo of UNESCO's policy guidelines for mobile learning content which were published in 2013 (UNESCO 2013). Moreover, the results show that there was a significant increase in using mobile devices for learning compared to the project conducted in 2010. Globally, the project shows a valuable increase in the use of mobile devices for learning. The result supported an opinion that 'it seems likely that mobile phones will soon be ubiquitous in developed as well as developing countries in Asia' (So 2012, p. 9). Regarding the implication of mobile learning in Asia, during the project, UNESCO captured the gross enrolment in tertiary education in Asia as seen in Table 9.2.

In relation to the policy implications, a survey was conducted to gain some information regarding government support towards the implementation of mobile learning. Table 9.3 shows the results of a survey asking about whether the government actively supports the use of mobile phones in education?

Table 9.3 Government support on the use of mobile phones in education

Government support	Country
Yes, through initiatives by institutions and engaged individuals	China
	Malaysia
Yes, through specific projects or programmes with dedicated public funding	Japan
	Malaysia
	Singapore
	Taiwan
Yes, through specific projects or programmes with dedicated private funding	Japan
	Malaysia
	Singapore
	South Korea
Yes, through government initiatives including specific measures and incentives	Malaysia
No, not really	Thailand
Do not know	
Other	Indonesia

Source: So (2012)

As explained in the previous paragraph, following the project on mobile learning conducted in 2012, UNESCO (So 2012) launched a Policy Guidelines for Mobile Learning Content (referred to as PG ML Products) based on a belief that 'mobile technology can expand and enrich educational opportunities in diverse settings' (UNESCO 2013, p. 5). The guideline is very important since it aims at helping policy-makers to better understand what mobile learning is and how its unique benefits can be leveraged to advance progress towards Education for All (EVA). Moreover, based on the results of studies on mobile learning, UNESCO underlines the benefits of mobile learning as follows:

1. It expands the reach and equity of education. A number of studies on mobile learning have shown that it provides an excellent medium for extending opportunities to learners who may not have access to high-quality schooling.
2. It facilitates personalised learning. The mobile devices enable the learners to undertake independent learning.
3. It provides immediate feedback and assessment. Using mobile devices for learning, both learners and educators are equipped with faster and easier assessment facilities.
4. It enables anytime, anywhere learning. As people can easily carry their mobile devices, it becomes easier and more flexible for learners to access the learning materials or information anytime and anywhere.
5. It builds new communities of learners. They can invite other learners into a group of learners in order for them to communicate and share the knowledge with each other.
6. It enhances seamless learning. Using mobile devices also enables learners to access similar educational resources and information from a wide variety of devices such as desktop computers or laptops since they are stored on remote servers.

7. It bridges formal and informal learning. It means that by using mobile devices for learning, the boundaries between formal and informal education have blurred because it has enabled learners to learn independently by accessing supplementary materials in order to clarify ideas introduced by a classroom instructor.

8. It improves communication and administration of school management. Mobile devices have enabled school administrators to send the same messages to many recipients at the same time faster, making this more reliable, more efficient, and less expensive.

9. It maximises cost-efficiency. Mobile devices enable learners to access similar information through digital papers or books (UNESCO 2013, pp. 10–26).

This chapter will provide insight into the state of practice of mobile learning in Indonesia. In particular, this chapter will elaborate on the practice of mobile learning at Universitas Terbuka (The Indonesia Open University) as a dedicated distance learning university.

9.2 Mobile Learning in Indonesia

In Indonesia, the development of mobile learning has to be viewed in line with the development of the national infrastructure on Information and Communication Technology (ICT). It is very important to note that the ICT infrastructure in Indonesia is still unevenly distributed resulting also in uneven Internet accessibility. In general, although Internet users in Indonesia (around 78 million) are in the top five in Asia, the penetration rate is still around 30% (Internet WorldStats 2015). The rapid increase of Internet users has been contributed significantly to by the rapid increase in the mobile penetration rate. It is reported that the penetration of mobile phones in early 2015 had already reached 130% (BuddeComm 2015), which means that many Indonesians own more than one mobile device/number.

Online learning, in general, is still at an initial stage, and although the government has been encouraging universities to capitalise on online technology for learning, universities are still hesitant to fully move into the online learning space. One of the initiatives launched by the government to enhance the use of ICT for research and learning was the establishment of the Indonesian Higher Education Network (INHERENT) in 2006, which is a network that connected 32 universities located in every province in Indonesia (http://www.inherent-dikti.net/) combined with an allocation of competitive grants for universities to collaborate on developing educational software and content. This project has produced many educational applications including learning management systems (LMS), educational content and their repositories, as well as some experimentations of eLearning provisions. Unfortunately, support from the government for the network was discontinued before it could actually support universities to integrate online learning into their mainstream classroom learning system. Nevertheless, several big public universities continued developing their eLearning strategies to supplement and complement

their classroom lectures. Recent data in 2012 show that 50 out of 3,070 private and public higher education institutions reported to the Ministry of Education's Directorate General of Higher Education that they have developed eLearning systems (Alamsyah and Ramantoko 2012).

The development of eLearning practice combined with the high penetration of mobile phones has triggered the birth of mobile learning in Indonesia. Mobile learning is practised in many higher educational institutions because of its capabilities in enhancing time and place flexibilities, in reaching wider audiences, and in enhancing the ease of updating as well archiving content. Especially for open education, Tsinakos (2013) mentioned that mobile learning is an alternative method of eLearning which enables the principles of open education that are flexibility, modularity, and time and place independence. As for classroom teaching and learning, mobile learning is used either to supplement or complement classroom activities or to substitute classroom activities altogether thus reducing the frequency of face-to-face classroom meetings (Panjaitan 2012). A survey in 62 higher education institutions conducted by Padmo et al. (2013) reveals that all institutions claimed to have used mobile learning in their instruction. Forty-nine percent of them claimed to have had used it for more than 5 years, and 23% of them claimed that they have used mobile learning for more than 10 years. The survey also found that the usage of what they claimed to be 'mobile learning' can hardly be considered as a 'real' learning process. Data show that 61.3% of institutions use mobile technology only for giving reminders or notifications of important dates/events, and 54.7% of institutions use it only for information purposes. It is encouraging, however, to see that 51.6% of the surveyed institutions also claimed to have used mobile technology for providing students with access to their digital library.

From the students' point of view, it is estimated that only about 25.8% of learners in the respondent's institution are actually using their mobile devices for any learning purposes. Regarding the reasons for low adoption of mobile devices for learning, many respondents stated that it was mostly caused by the following reasons: the small screen size of the device (38%), the cost of developing mobile learning (13%), limited connectivity (6%), and limited bandwidth (6%); in addition, their reasons also related to monthly costs, security issues, as well as lack of skill and expertise in operating the application (Padmo et al. 2013). Another reason mentioned by the students related to the fact that they still consider face-to-face meetings as an important part of their learning process (Padmo et al. 2013). These factors are in line with the three basic elements required for mobile learning activities mentioned by Miftah (2012), i.e. (1) the accessibility of the Internet, (2) the availability of facilities for learning, both print materials and technology devices, and (3) the availability of tutors to assist learners.

The results of the study conducted by Padmo et al. (2013) show that the use of mobile learning in Indonesia is still in its early stage and has not yet touched the real learning experience of the learners. However, one of the surveyed institutions which claimed to have used mobile technology for learning, Universitas Terbuka (UT), has practised mobile learning in a comprehensive way. That is understandable since UT is an open university and a dedicated distance learning university in Indonesia.

9.3   Mobile Learning at Universitas Terbuka (The Indonesia Open University)

Universitas Terbuka (UT) was established in 1984 with a special mission to open up access to higher education. UT currently has more than 400,000 active students spread throughout the archipelago of Indonesia and abroad. With such a large number of students, UT very much relies on information and communication technologies (ICTs) for all its academic and administrative affairs. Although printed materials are the main medium for delivering content, UT employs various media and channels for providing the supplementary learning materials and learning supports.

As the Internet became available, UT started to develop online learning support, commencing in 1997 and started to use a web-based application for online tutorials in 2000. Online tutorials are offered to UT's students as one innovative way of enhancing interactivity among students and between students and tutors. The UT's online tutorials aimed to build communities of learners, and this is in line with one of the benefits of using mobile learning as listing by UNESCO (2013). Via online tutorial a group of UT students is encouraged to communicate and share knowledge with each other. Figure 9.1 shows the screen capture of UT's online tutorial web page.

As the online tutorial system became settled and mobile technologies become more available, UT began to develop its mobile learning system by creating the mobile version of its website in 2002, followed by creating the mobile interface of the online tutorial services in 2007. The full use of a mobile application for tutorials

Fig. 9.1 The screen capture of UT's online tutorial webpage

Fig. 9.2   The appearance of UT's online tutorials in mobile devices

was started in 2013 using the Moodle mobile application (app) and was designed to be used on mobile devices such as smartphone, tablet, notebook, and laptop. After several years of development, the current mobile learning interface has become an integral part of the UT online learning system. In other words, UT students can now study using their mobile devices from the very first activity of registering for courses, paying tuition fees, obtaining digital learning materials, accessing the digital library, reading online journals, as well as accessing online tutorials. The only activity that cannot be done through students' mobile devices is examinations. Students have to take their examinations face-to-face in the various locations or online in one of UT's regional offices. The online examinations are not yet designed to be accessed from outside UT's intranet system for security purposes. Figure 9.2 shows the appearance of UT's online tutorials on mobile devices.

UT's mobile learning system was designed comprehensively involving various working units including the Computer Center, the Faculties, and the Multimedia Production Center. The Computer Center is responsible for developing the system and the apps (LMS) as well as the necessary infrastructure, while the Faculty and the Multimedia Production Center are responsible for developing the multimedia learning content (Padmo et al. 2014). The process of content development itself involves many activities starting from selecting the media format (text, audio, video, etc.) to the actual production of the media. This also includes the selection and integration of open educational resources (OER) as encouraged by the university. With the integration of OER in learning materials, students will have more access to knowledge. In the online tutorial itself, the OER materials uploaded by tutors include articles (accessed via http://jurnal.ut.ac.id/), videos or web-based materials (accessed via https://www.youtube.com/channel/UCoUPOCg0m4hGeHW_VP-q6QA/ and http://web-suplemen.ut.ac.id/html/suplemen/index.html), and self-assessments (accessed via http://elearning.ut.ac.id/lm/). Some of these OER materials are provided by UT and could easily be accessed through the SUAKA Portal (Sumber Pembelajaran Terbuka or OER) on the UT website. Besides getting OER materials from SUAKA, there are many institutions providing OER that can be utilised by tutors to enhance online tutorials, such as MERLOT (https://www.merlot.org/merlot/index.htm), OER Commons (https://www.oercommons.org/), and many others.

de los Arcos et al. (2015) found that the use of OER leads to improvement in student performance and satisfaction. There is stronger evidence that the use of OER improves related factors for students such as enthusiasm for study, confidence, and overall interest. Therefore, it is part of the policy in UT to include OER in learning material for students since it 'provide(s) a strategic opportunity to improve the quality of education as well as facilitate policy dialogue, knowledge sharing, and capacity building' (UNESCO n.d., para. 1). Once the tutorial content is ready, the faculty will start offering the service to students by assigning a tutor or a team of tutors who most likely are those who develop the content as facilitators. From the university's and tutors' perspectives, the activities undertaken for the provision of mobile tutorials are the same as those for the regular online tutorials. It is the students who would see the difference as they would access them through their mobile devices using the mobile interface.

The current interface for the mobile tutorials is based on Moodle Mobile, which converts the web-based online tutorials for the mobile user application/interface. This application is quite comprehensive, which enables students to read the learning materials uploaded by tutors as well as participating in the discussion forum by posting/making comments or asking/answering questions. Therefore, this Moodle Mobile application is really useful for students when they are 'on the road' and have no access to their PCs or laptops/tablets. In 2015, Padmo, Ardiasih, and Idrus conducted a study on students' perceptions about the use of mobile learning for their learning activities. Seven hundred and sixty-seven (767) out of 5,000 students from different study programs at UT, chosen by stratified sampling, responded to the survey. They were asked, among other questions, to identify their use of the various mobile learning services available from UT's system. The results show that 94% of the respondents claimed to use the mobile learning facilities to access online tutorials. This is very reassuring to UT showing that students have been able to utilise their mobile technologies for their learning process, although only 55.5% expressed satisfaction with the service. The other major use is for reading news and announcements, which was claimed by 56% of the respondents. As stated by UNESCO (2013) one of the benefits of using mobile learning is to improve communication and administration management. Mobile devices have enabled UT's administrators to deliver news and announcements to students at the same time, faster, more efficient, and less expensive. Figure 9.3 shows the various use of UT's mobile learning by students.

The results of the survey by Padmo et al. (2015) also show that students use different types of devices for accessing the mobile learning services. The types of mobile communication devices available and used by UT students for accessing online learning include cell phones, smartphones, tablets, netbooks, notebooks, laptops, portable media players, and PCs as seen in Fig. 9.4. Among the mobile devices, smartphones and laptops are to be the top two devices used most often by students (59.5% and 57.8%).
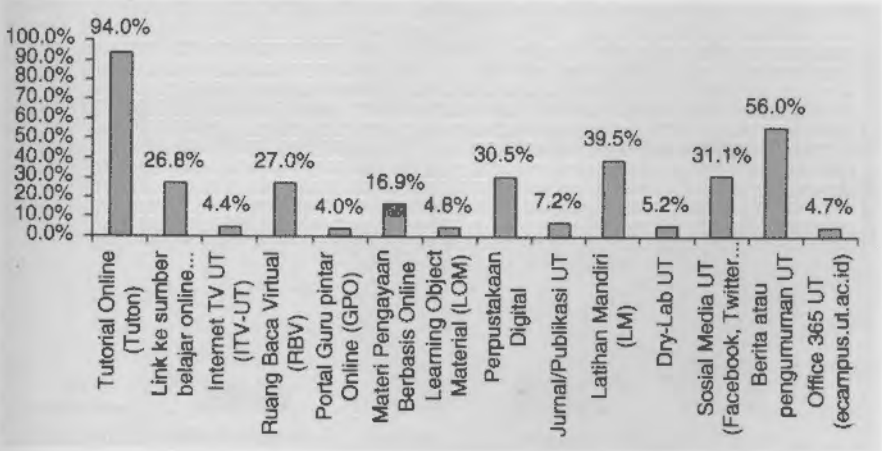
Fig. 9.3 Various uses of mobile services by students (From *left* to *right*: Online tutorials, links to other educational resources, Internet TV, virtual reading room, teacher portal, supplementary learning materials, LOM, digital library, UT publications, self-test, dry-lab, social media, news and announcements, and e-mails)
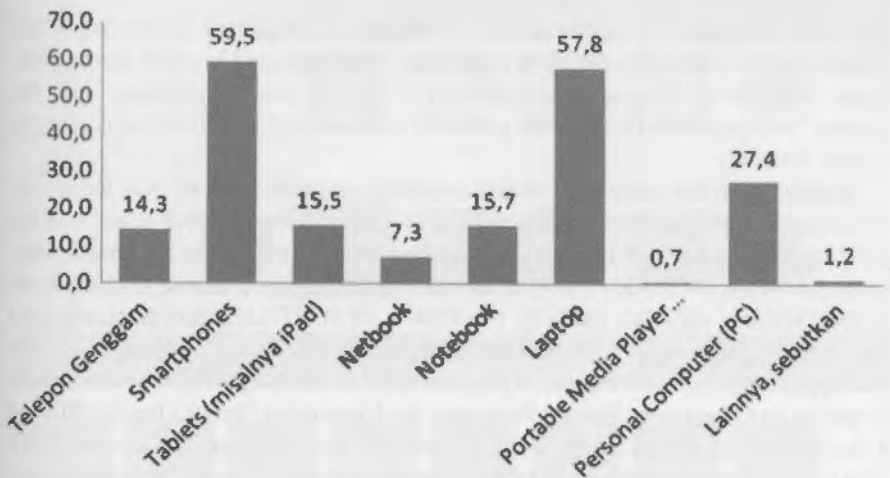
Fig. 9.4 The use of a variety of mobile devices (From *left* to *right*: hand phones, smartphones, tablets, netbook, notebook, laptop, portable media player, PC, and others)

The results of the survey also reveal that students use different operating systems, which include Blackberry, iPhone, Android, Windows Mobile, and WebOS. However, data show that 85.6% of student respondents use Android-based mobile devices as seen in Fig. 9.5 (Padmo et al. 2015). This seems to be in line with the result of a survey conducted by Alia and Ngazis (2014) that shows that almost all mobile Internet users (87.3%) in Indonesia use the Android smartphone.
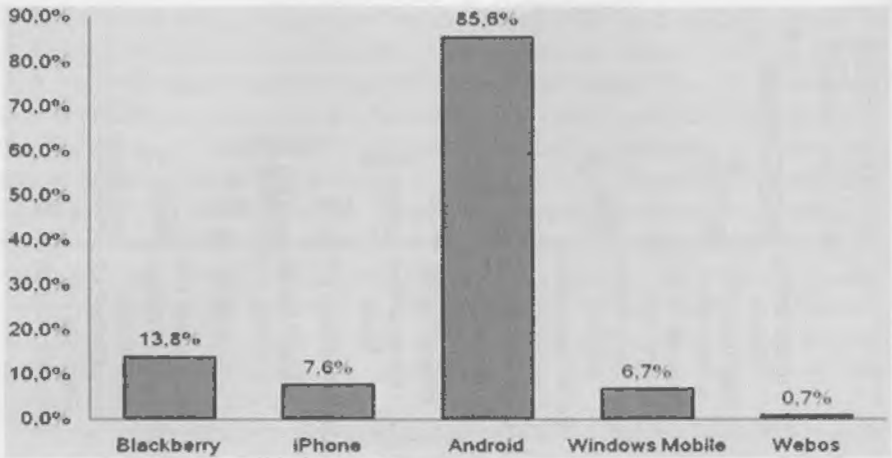
Fig. 9.5 The mobile operation system

9.4 The Future of Mobile Learning in Indonesia

The high penetration of mobile devices in Indonesia is expected to increase (Gusti 2014), thereby enhancing Internet penetration. This enhanced Internet access combined with the continuous development of learning content uploaded into the Internet is expected to increase the potential utilisation of mobile technologies for mobile learning.

In addition to the many educational resources available from all over the world, it is important that Indonesian educational institutions also develop content in the national language, which is Bahasa Indonesia. The big Indonesian universities that were part of the INHERENT project mentioned previously, continue to share some of their learning materials publicly. In addition, all of UT's learning materials have now been digitised and are accessible/downloadable through its online bookstore (the apps for the bookstore are freely downloaded from Google Play). Furthermore, as part of its Community Service Programs, the Universitas Terbuka has established a dedicated OER portal called SUAKA (Sumher Pembelajaran Terbuka or OER), which now contains thousands of multiplatform open materials (http://www.ut. ac.id/OER/index.html). The screenshot of UT's SUAKA, Free Apps in the Google Play, and the Online Digital Bookstore are shown in Fig. 9.6.

Several digital materials for master-level programs have even been formatted as digital files allowing students to be interactive with the materials and complete activities such as highlighting and taking notes. These materials were prepared with Kotobee Publishers, a well-known company that design books rich with interactivity and multimedia for all platforms. These materials are designed to be downloaded on computer tablets. The reason for using Kotobee Publishers was due to the company's capacity to provide authoring tools to create an interactive e-book technology that suited Universitas Terbuka's needs. The advantages of the Kotobee

Fig. 9.6   Portal of SUAKA-UT and UT's free apps in the Google Play
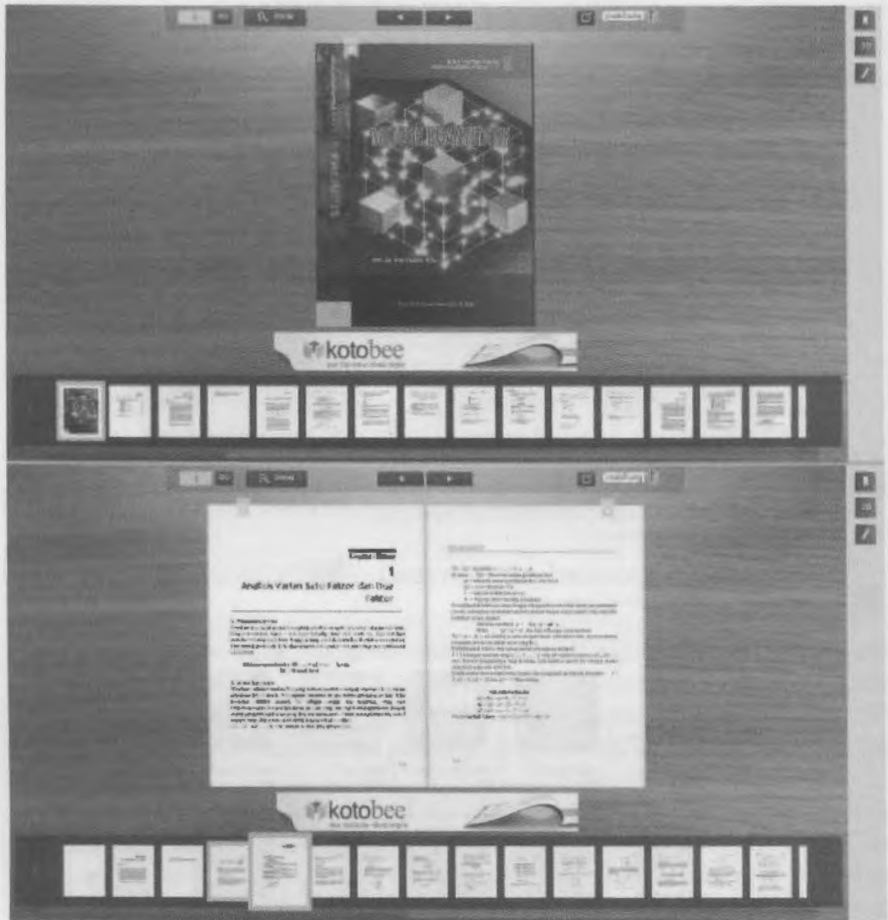
Fig. 9.7 The Kotobee-based digital learning materials (Source: Kotobee n.d.)

Publisher tool are mainly its interactivity and the ability to be freely customised. Kotobee Publishers allow users to create a well-designed layout and include their own logo and brand name. In terms of the learning process, Kotobee Publishers allow instructional designers to enhance learning experiences with interactive textbooks and enrich content by adding interactive elements such as video, audio, questions, interactive images, galleries, 3D, and more (Kotobee n.d.).

The UT's Kotobee materials were created and designed to be 'interactive' and enriched with video for visualisations of concepts. It is hoped that with these kinds of materials, the quality of students' learning processes and students' learning experiences can be enhanced. Although it is currently limited to graduate level courses, UT will gradually convert its undergraduate level course materials too, using Kotobee or a similar platform. Figure 9.7 shows the design of UT's Kotobee Materials.

Fig. 9.8 The portal of Rumah Belajar (Source: Kemdikbud n.d.)

At the lower level of education, the Ministry of Education and Culture's Center for ICT has also been developing thousands of learning materials for both teachers and students of primary and secondary schools which is housed in the portal of 'Rumah Belajar' (Home of Learning), which can be accessed through https://belajar.kemdikbud.go.id/SumberBelajar/, using interfaces for both PCs and mobile devices. One of the goals of the development of the portal 'Rumah Belajar' was to introduce the concept of lifelong education for students at the primary and secondary school level. Through the use of the portal 'Rumah Belajar' as shown in Fig. 9.8, they will understand that lifelong education can be undertaken anywhere and anytime using ICT.

This development in online educational materials is seen to be complemented by the development of online and blended learning in Indonesia. A number of universities in Indonesia have implemented a blended learning approach in the learning process. The Institute Technology Bandung (ITB), the University of Indonesia, Universitas Pendidikan Indonesia (UPI), and the University of Bina Nusantara are among a few that have offered blended learning for some of their courses.

Furthermore, the existence of social media has also contributed to the popularity of online learning in Indonesia. Tu and McIsaac (2002) stated that an important factor to consider when enhancing distance learning is social presence which consists of three dimensions: social context, online communication, and interactivity. In line with this, Schroeder (2013) mentioned that social presence and online interaction can be accommodated by mobile technologies. There are a number of chatting apps provided in mobile technologies which enable students to communicate with each other, such as Facebook and Whatsapp. Social media users in Indonesia have created informal learning modes that are complementary to the blended learning approach. The survey conducted by Padmo et al. (2013), for example, reveals that 55% of respondents have utilised media or social networks as part of the provision of information or mobile learning content. Thus, it appears that a distribution of information through social networks can be an effective strategy for mobile learning. These all can eventually increase the enhancement of mobile learning practices in Indonesia.

Nevertheless, several issues need to be addressed for better implementation of real mobile learning in Indonesia (Padmo et al. 2013). Those issues include the need for better and seamless Internet access, better and more user-friendly LMS, and most importantly higher ICT-related competencies of human resources. The last aspect is very important as the success of mobile learning depends very much on the willingness of lecturers and students to change and to try something new, on the readiness of lecturers and students to navigate the LMS, and on the ability of the lecturers to develop attractive learning materials of a high quality, that are easy to operate (Padmo et al. 2013). This seems to be in line with Topolewski et al. (2013) who mentioned that the implementation of mobile learning should be supported by a well-trained teacher who is ready to change their role as the lack of teacher training and engagement can impact negatively on the success of technology initiatives in education.

Another important aspect to be considered for future development of mobile learning in Indonesia is conducting research on mobile learning. In terms of research activities in this area, based on the study conducted by Padmo et al. (2013), the number of respondents who were involved in research on mobile learning was very low (30.4%). Research that has been conducted was focused on several issues, such as the development of teaching materials that can be accessed on mobile devices; optimising the role of libraries and websites as a medium for supporting mobile learning; development of tablet-based learning materials; and development of Mobile LMS for certain subjects. The research on mobile learning in Indonesia will provide a significant contribution to the future of mobile learning in Indonesia.

9.5   Concluding Remarks

The advancement of mobile technology has opened up and nurtured the emergence of mobile learning. Many educational institutions incorporate mobile learning into their learning systems. The ability of mobile technology in increasing learning flexibility combined with the availability of various mobile devices has been appreciated by both educational institutions and students. Nevertheless, the utilisation of mobile learning in Indonesia is still in the initial stage and is mostly used only to provide access to the digital library, to supplement or complement classroom learning, to broadcast announcements and other one-way information and administrative services. One exception is the mobile learning at Universitas Terbuka, which allows students to literally pursue their entire learning process using mobile devices since the use of mobile learning at Universitas Terbuka is fully supported by the institution's policy, in terms of funds and resources. The Universitas Terbuka allocates sufficient funds for procurement and maintenance of ICT hardware and various applications, training, and procurement of outsourced developments. With the significantly high rate of mobile penetration, which still continues to rise, supported by government policy in terms of ICT infrastructure, it is believed that the practice of mobile learning in Indonesia will continue to increase.

References

Alamsyah, A., & Ramantoko, G. (2012). *Implementation of m-learning in higher education in Indonesia.* Proceedings of 3rd International Conference on Technology and Operation Management 2012. Retrieved January 9, 2016 from http://www.academia.edu/3378168/ Implementation_of_M-Learning_in_Higher_Education_in_Indonesia

Alia, S. S., & Ngazis, A. N. (2014). *Riset:Ada 11,5% pengguna smartphone mahal di Indonesia.* Retrieved November 26, 2014 from http://teknologi.news.viva.co.id/news/ read/562546-riset--ada-11-5--pengguna-smartphone-mahal-di-indonesia

de los Arcos, B., Farrow, R., Perryman, L. -A., Pitt, R., & Weller, M. (2015). *OER evidence report 2013–2014. OER research hub.* Retrieved March 15, 2016 from https://oerknowledgecloud. org/sites/oerknowledgecloud.org/files/20151117-OER-Hub-Data-Report.pdf

Baggaley, J. (2007). The PANdora model of collaborative distance education research: Collated interviews and responses. *Distance Education, 28*(2), 245–252. doi:10.1080/01587910701439274.

BuddeComm (2015). *Indonesia telecommunications research.* Retrieved January 23, 2015 from URL: http://www.budde.com.au/Research/Countries/Indonesia/

Chen, B., & Denoyelles, A. (2013). *Exploring students' mobile learning practices in higher education.* Retrieved January 23, 2015 from http://er.educause.edu/articles/2013/10/ exploring-students-mobile-learning-practices-in-higher-education

Chen, B., Seilhamer, R., Bennett, L., & Baue, S. (2015). *Students' mobile learning practices in higher education: A multi-year study.* Retrieved on January 23, 2015 from http://er.educause. edu/articles/2015/6/students-mobile-learning-practices-in-higher-education-a-multiyear-study

eMarketer.Com (2013). *Asia-Pacific reaches whopping 2.5 billion mobile phone users.* Retrieved March 16, 2016 from http://www.emarketer.com/Article/ Asia-Pacific-Reaches-Whopping-25-Billion-Mobile-Phone-Users/1010247.

Gusti, G. (2014). *Menkominfo: 270 juta pengguna ponsel di Indonesia.* Retrieved on March 10, 2014 from http://ugm.ac.id/id/berita/8776-menkominfo%3A.270.juta.pengguna.ponsel. di.indonesia

Internet WorldStats. (2015). *Internet usage in Asia*. Retrieved March 15, 2016 from http://www.internetworldstats.com/stats3.htm.

Kemdikbud. (n.d.). *Rumah Belajar*, Retrieved March 15, 2016 from https://belajar.kemdikbud.go.id/SumberBelajar

Kotobee. (n.d.). *The comprehensive solution for interactive ebook creation*. Retrieved March 15, 2016 from http://www.kotobee.com

McGraw Hill Education. (2014). *Three ed-tech trends showing why mobile learning is on the rise*. Retrieved January 20, 2015 from http://www.mheducation.com/blog/thought-leadership/three-ed-tech-trends-showing-why-mobile-learning-is-on-the-rise.html

Miftah, M. (2012). *Implementasi teori belajar dalam sistem pembelajaran mobile Learning. [The implementation of learning theory and instruction system of mobile learning]*. Retrieved May 30, 2017, from http://jurnalkwangsan.kemdikbud.go.id/index.php/jurnalkwangsan/article/view/6

Padmo, D., Huda, N., Idrus, O., & Ardiasih, L. (2013). *Pemanfaatan pembelajaran mobile di Indonesia dan arah perkembangannya di masa mendatang, tahap I (The use of mobile learning in Indonesia and the direction of development in the future, Part I)*. Unpublished Research Report. Jakarta: Universitas Terbuka.

Padmo, D., Idrus, O., & Ardiasih, L. (2014). *Pemanfaatan pembelajaran mobile di Indonesia dan arah perkembangannya di masa mendatang, Tahap II (The use of mobile learning in Indonesia and the direction of development in the future, Part II)*. Unpublished Research Report. Jakarta: Universitas Terbuka.

Padmo, D., Idrus, O., & Ardiasih, L. (2015). *Pemanfaatan Perangkat Mobile Dalam Meningkatkan Akses Pembelajaran Bagi Mahasiswa Universitas Terbuka di Indonesia (The use of mobile devices in improving learning access for Universitas Terbuka's students in Indonesia)*. Unpublished Research Report. Jakarta: Universitas Terbuka.

Panjaitan, Y. (2012). *Pembelajaran berbasis mobile online [Online mobile-based instructions]*. Retrieved March 16, 2016 from http://edukasi.kompasiana.com/ 2012/05/28/ pembelajaran-berbasis-mobile-online-465791.html

Schroeder, B. (2013). Mobile and digital: Perspectives on teaching and learning in a networked world. In A. Tsinakos & M. Ally (Eds.), *Global mobile learning implementations and trends* (pp. 105–118). Beijing: China Central Radio & TV University Press.

So, H.J. (2012). *Turning on mobile learning in Asia: Illustrative initiatives and policy implications. UNESCO working series on mobile learning*. Paris: UNESCO. Retrieved March 16, 2016 from http://unesdoc.unesco.org/images/0021/002162/216283E.pdf

Topolewski, D., Annie, S., Shubo, Y., & Pallachola, S. (2013). Challenges for successful adoption of mobile learning. In A. Tsinakos & M. Ally (Eds.), *Global mobile learning implementations and trends* (pp. 4–44). Beijing: China Central Radio & TV University Press.

Traxler, J., & Wishart, J. (2011). *Making mobile learning work: Case studies of practice*. Retrieved January 8, 2016 from http://escalate.ac.uk/8250

Tsinakos, A. (2013). State of mobile learning around the world. In A. Tsinakos & M. Ally (Eds.), *Global mobile learning implementations and trends* (pp. 4–44). Beijing: China Central Radio & TV University Press.

Tu, C. H., & McIsaac, M. (2002). The relationship of social presence and interaction in online clasess. *American Journal of Distance Education, 16*(3), 131–150. doi:10.1207/S1538928692AJDE_2.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2013). *Policy guidelines for mobile learning*. Retrieved on January 7, 2016 from http://unesdoc.unesco.org/images/0021/002196/219641e.pdf

United Nations Educational, Scientific and Cultural Organization (UNESCO). (n.d.). *Open educational resources*. Retrieved March 15, 2016, from http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/

Valk, J., Rashid, A. T., & Elder, L. (2010). Using mobile phones to improve educational outcomes: An analysis of evidence from Asia. *IRRODL*, retrieved March 16, 2016 from www.irrodl.org/index.php/irrodl/article/view/794/1487

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Mobile Learning in Higher Education in the Asia-Pacific Region

Harnessing Trends and Challenging Orthodoxies

If mobile technologies are to be effectively used in education, how do we best implement sustainable mobile solutions for teaching and learning? The aim of this handbook is to support educators and policy makers who are investing in innovations in digital education to develop effective and sustainable mobile learning solutions for higher education environments.

Authors from sixteen countries across the Asia-Pacific region have collaborated to share their experiences with developing and implementing mobile learning initiatives. These projects focus on a variety of aspects of mobile learning innovation, from the trial adoption of existing social media platforms on mobile devices and the development of specialised applications or mobile learning systems, to the large-scale, interuniversity implementation of technologies and pedagogies to support mobile learning.

Each chapter addresses challenges and solutions at one or more levels of mobile learning innovation within the education system, encompassing the student perspective, the educator perspective, technical processes, policies and organisational strategy, and leadership. The book also offers a unique perspective on the integration of mobile learning innovations within the educational, political and cultural environments of Asia-Pacific countries.

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